Docket No.: K5675.0005/P005
(PATENT)

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Cha-Gyun Jeong

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| Application No.: Not Yet Assigned | Group Art Unit: N/A |
| Filed: January 24, 2002 | Examiner: Not Yet Assigned |

For: METHODS AND DEVICES FOR DIGITAL
  VIDEO SIGNAL COMPRESSION AND
  MULTI-SCREEN PROCESS BY MULTI-
  THREAD SCALING

## FIRST PRELIMINARY AMENDMENT

**Box Non-Fee Amendment**
Commissioner for Patents
Washington, DC  20231

Dear Sir:

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows:

## IN THE SPECIFICATION

Please rewrite the paragraph at page 2, lines 15 - 24 as follows:

As explained above, the conventional system has independent modules for the compression unit (10) and the multi-screen processor (20) because the compression unit (10) and the multi-screen processor (20) are programmed to process video data in different resolutions. In other words, the compression unit (10) may process video data real time only if it is programmed to be a 30 frame transmission mode at the resolution of 352x240. Also, the multi-screen processor (2) for 16 screens, for example, may process video data real time only if it is programmed to be a 30 frame transmission mode at the resolution of

180x120. Therefore, the conventional N-channel real time DVR with independent compression unit (10) and multi-screen processor (20) requires 2xN analog/digital converters.

Please rewrite the paragraph at page 3, lines 1-5 as follows:

However, ordinary analog/digital converters consume an extraordinary amount of the current, which causes great consumption of electric power. Accordingly, they generate a significant amount of heat impairing stability of the system. Furthermore, conventional multi-channel DVR systems are expensive because (N channel)x2 analog/digital converters are required.

Please rewrite the paragraph at page 3, line 14- page 4, line 13 as follows:

In order to accomplish the above-mentioned purpose, the present invention's method to compress and process for multi-screens digital video signals by multi-thread scaling uses a single integrated analog/digital converter for each channel for compression/multi-screen process. The present invention's method comprises: (a) a step to scale the resolutions of digital video signals outputted from analog/digital converters depending on the even/odd fields of the inputted video signals; and (b) a step to compress or process for multi-screens the scaled digital video signals according to the resolutions scaled in the said step (a). The present invention's device for compression and multi-screen process of digital video signals by multi-thread scaling comprises: multi-channel analog/digital converters, which generate even/odd field indicators depending on the fields of the inputted multi-channel video signals and scale the resolution of each channel's video signals for compression or for multi-screen process while converting such signals into digital signals according to the even/odd fields of the signals; a compression FIFO which stores, for compression, the video signals outputted from each channel's analog/digital

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converter based upon the even/odd field indicator of such analog/digital converter; a multi-screen FIFO which stores, for multi-screen process, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of such analog/digital converter; a CPU which initializes each channel's analog/digital converter, the compression FIFO, and the multi-screen FIFO, and controls each channel's analog/digital converter so that the converted digital video signals may be scaled into various resolutions depending on the fields of the inputted multi-screen video signals; and a video processor which transmits the video signals which were inputted to the said multi-screen FIFO to the video memory according to the rules pre-determined for the multi-screen process.

Please rewrite the paragraph at page 6, line 21 - page 7, line 2 as follows:

The compression FIFO (42) stores the video signals outputted from each channel's analog/digital converter (41) if the even field/odd field indicator is even. Although the CPU (44) may fetch digitalized video signals after polling the said analog/digital converter group (41), the present invention uses the compression FIFO (42) in order to reduce the load on the CPU (44), to raise the transmission efficiency of video signals, and to reduce transmission errors.

Please rewrite the paragraph at page 7, lines 13-15 as follows:

The video processor (45) transmits the video signals which have been inputted to the multi-screen FIFO to the video memory in accordance with the rules pre-determined for the multi-screen process.

Please rewrite the paragraph at page 8, lines 7-12 as follows:

The present invention enables the relevant system to be operated by half [N] as many as conventionally needed converters [2N] in the related art field. Thus, the present invention saves 50% of the electricity and expense required for the conventional system. In addition to the effect of saving the electricity consumed for the system, the present invention also increases the stability of the multi-channel DVR system by reducing the number of required analog/digital converters by half.

## IN THE CLAIMS

Please rewrite claim 7 as follows:

7. The device for compression and multi-screen process of digital video signals by multi-thread scaling comprising:

multi-channel analog/digital converters, which generate even/odd field indicators depending on the fields of the inputted multi-channel video signals and scale the resolution of each channel's video signals for compression or for multi-screen process while converting each channel's video signals into digital signals according to the even/odd fields;

a compression FIFO which stores, for compression, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of the said analog/digital converter;

a multi-screen FIFO which stores, for multi-screen process, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of the said analog/digital converter;

a CPU which initializes each channel's analog/digital converter, the compression FIFO and the multi-screen FIFO, and controls each channel's analog/digital converter so that the converted digital video signals may be scaled into various resolutions depending on the fields of the inputted multi-screen video signals; and

a video processor which transmits the video signals which have been inputted to the said multi-screen FIFO to the video memory according to the rules pre-determined for the multi-screen process.
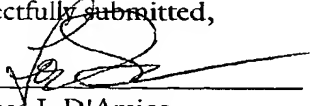
## REMARKS

The specification and claim 7 have been amended to improve their form. Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated:   January 22, 2002                    Respectfully submitted,

By _____

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**Version With Markings to Show Changes Made**

Please amend the paragraph at page 2, lines 15 - 24 as follows:

As explained above, the conventional system has independent [dependent] modules for the compression unit (10) and the multi-screen processor (20) because the compression unit (10) and the multi-screen processor (20) are programmed to process video data in different resolutions. In other words, the compression unit (10) may process video data real time only if it is programmed to be a 30 frame transmission mode at the resolution of 352x240. Also, the multi-screen processor (2) for 16 screens, for example, may process video data real time only if it is programmed to be a 30 frame transmission mode at the resolution of 180x120. Therefore, the conventional N-channel real time DVR with independent compression unit (10) and multi-screen processor (20) requires 2xN analog/digital converters.

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Please amend the paragraph at page 3, line 14- page 4, line 13 as follows:

In order to accomplish the above-mentioned purpose, the present invention's method to compress and process for multi-screens digital video signals by multi-thread

scaling uses a single integrated analog/digital converter for each channel for compression/multi-screen process. The present invention's method comprises: (a) a step to scale the resolutions of digital video signals outputted from analog/digital converters depending on the even/odd fields of the inputted video signals; and (b) a step to compress or process for multi-screens the scaled digital video signals according to the resolutions scaled in the said step (a). The present invention's device for compression and multi-screen process of digital video signals by multi-thread scaling comprises: multi-channel analog/digital converters, which generate even/odd field indicators depending on the fields of the inputted multi-channel video signals and scale the resolution of each channel's video signals for compression or for multi-screen process while converting such signals into digital signals according to the even/odd fields of the signals; a compression FIFO which stores, for compression, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of such analog/digital converter; a multi-screen FIFO which stores, for multi-screen process, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of such analog/digital converter; a CPU which initializes each channel's analog/digital converter, the compression FIFO, and the multi-screen FIFO, and controls each channel's analog/digital converter so that the converted digital video signals may be scaled into various resolutions depending on the fields of the inputted multi-screen video signals; and a video processor which transmits [to the video memory] the video signals which were inputted to the said multi-screen FIFO to the video memory according to the rules pre-determined for the multi-screen process.

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Please rewrite the amend at page 8, lines 7-12 as follows:

The present invention enables the relevant system to be operated by half [N] as many as conventionally needed converters [2N] in the related art field. [By implementing a system equivalent to the conventional system, which requires 2xN ADC, with only N analog/digital converters,] Thus, the present invention saves 50% of the electricity and expense required for the conventional system. [by 100%.] In addition to the effect of saving the electricity consumed for the system, the present invention also increases the stability of the multi-channel DVR system by reducing the number of required analog/digital converters[.] by half.

IN THE CLAIMS

Please amend claim 7 as follows:

7. The device for compression and multi-screen process of digital video signals by multi-thread scaling comprising:

multi-channel analog/digital converters, which generate even/odd field indicators depending on the fields of the inputted multi-channel video signals and scale the resolution of each channel's video signals for compression or for multi-screen process while converting each channel's video signals into digital signals according to the even/odd fields;

a compression FIFO which stores, for compression, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of the said analog/digital converter;

a multi-screen FIFO which stores, for multi-screen process, the video signals outputted from each channel's analog/digital converter based upon the even/odd field indicator of the said analog/digital converter;

a CPU which initializes each channel's analog/digital converter, the compression FIFO and the multi-screen FIFO, and controls each channel's analog/digital converter so that the converted digital video signals may be scaled into various resolutions depending on the fields of the inputted multi-screen video signals; and

a video processor which transmits [to the video memory] the video signals which have been inputted to the said multi-screen FIFO to the video memory according to the rules pre-determined for the multi-screen process.

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